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Can we rely on iFR for avoiding FFR? Conclusions of a 5-year experience

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Background: Recently, the instantaneous wave free ratio (iFR), has been proposed an alternative or complementary method to fractional flow reserve (FFR). This new method does not require the use of adenosine and may expedite the speed of functional assessment. The iFR "hybrid strategy" relies on values $<$0,86 or $>$0,93 as definitive results which would not require the use of FFR. However, this strategy is much less consensual than FFR alone.

Purpose: We aimed to assess the concordance of FFR and iFR results using

the principle of the “hybrid strategy”, based on the 5-year experience of a single center. We also aimed to analyse the effect of iFR in the operator’s decision to proceed to FFR, and its impact on procedure duration and radiation time/dosage.
Methods: Single-center registry of all patients undergoing functional coronary lesion assessment during 5 years. FFR was used as a gold standard (with a cut-off point for intervention $\leq$0,80) for assessing the diagnostic accuracy of iFR in every patient who underwent measurements with both techniques.
For analysis purposes, an iFR value $<$0,86 was considered positive (i.e. proceed to intervention), a value $>$0,93 was considered negative (i.e. defer intervention). Values in between were deemed inconclusive. For statistical analysis we used the T student and Chi-Square tests.
Results: Functional testing was undertaken in 326 patients (67±11 years, 65,6% male), encompassing 402 lesions. 154 lesions underwent assessment with both techniques, 222 by FFR only and 26 cases iFR only.
The average iFR was 0,9±0,1. 60 lesions had an iFR $>$0,93 and 21 an iFR $<$0,86. An iFR value between 0,86 and 0,93 was strongly associated with the decision to proceed to FFR (χ^2=30,1; p$<$0,001): the operators chose to perform FFR in 93 out of 94 cases. In the remaining cases, FFR was performed in 69,1% of cases, with no differences between values $<$0,86 vs $>$0,93 (71,4% vs 68%; p=0,792). In these cases, there was a statistically significant concordance of 87% between the iFR and FFR results (χ^2=22,43; p$<$0,001). Notwithstanding, there were 4 out of 13 cases (30,7%) of positive iFR with negative FFR and 3 out of 42 (7,1%) cases of negative iFR and positive FFR. This difference was statistically significant (p=0,026).
Regarding procedural time, radiation time and radiation dose, there were no statistically significant differences between patients who only underwent iFR, FFR only, or both techniques.
Conclusions: The iFR results were inconclusive (i.e. between 0,86 and 0,93) in most cases. There was a high degree of concordance between the iFR and FFR values. However, a significant proportion of patients, particularly in cases of positive iFR ($<$0,86), were classified as negative by FFR. The use of iFR had no impact on procedural time, radiation time and radiation dose.